Differentiating the Chemical, Biological, and other Environmental Attacks

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The Problems

- You are called by a commander in a panic. His troops outside of Baghdad, advancing to the berms, were in partial MOPP gear, with most sleeping at night without masks on. Shells had been raining over all night. Most of a platoon, over a period of 30 minutes, has been incapacitated by severe nausea, headache, SOB and cough. What do you think? (How can you help him?)

The Problems

- The police have called your boss. Today on a bus/subway, an odor was detected, and since then there have been 20 persons on the vehicle that have been taken to hospital with HA, vomiting, and dizziness. The city wants your help. What do you think?

The Problems

- Phone call comes in from medics in the field in Iraq. Troops have been rummaging through an old warehouse, and came across canisters containing a white powder.
- Several of them have become acutely dyspneic and are sure they have found anthrax. What do you think?

General Rules
Time to Presentation

- Chemical agents---immediate (minutes to hours) effects
  - Exception: mustard---hours to > a day before symptoms
- Biological agents--delayed (usually days) presentations
  - Exceptions: toxins (Ricin, SEB, botulinum)

General Rules
Fever; Neuro symptoms

- Fever prominent in almost all biological agent afflictions
  - Exception: Botulinum. Paralysis alone.
- Neurological symptoms other than HA (confusion, LOC, sz) almost never occur in biological agent afflictions
  - Exception again: Botulinum. Paralysis.

Differentiation of Chemical, Biological, Look-alike syndromes

Agent or effect	Syndrome	Epidemiology	Clues to Diagnosis	Comment
Chemical agents				
Nerve agents				
By vapor	Rhinorrhea, miosis/blurry vision, SOB, bronchorrhea/wheezing; heavy: LOC/Sz/apnea/death	Minutes to hours after aerosol exposure; groups	Characteristic syndrome; epi---other humans, animals	*
By liquid	Localized sweating, nausea, V, weakness; heavy: as above	Minutes after splash exposure	As above	*
Mustard (vesicants)	Burning/blistering of skin, conjunctivae, upper/lower airway	Mustard—hours to (rare)>1 day after exposure. Other agents immediate. Groups.	Characteristic syndrome; 80% burns to each (Iraq/Iran war)	*
Biological agents				
Anthrax	Cough, chest pain, fever, rapid progression to resp/vascular collapse and death	1-6 days after aerosol or powder exposure. Groups.	CXR changes; bacterial diagnosis easy	
Smallpox	High fever, HA, myalgias for 3 days, then characteristic rash	7 days after initial exposure (aerosol, or other person)	Characteristic rash (not chickenpox)	Disaster because communi-cable.
Botulism	Progressive paralysis, no fever, with bulbar symptoms/signs; normal pupils	12-48 hours after aerosol or food exposure; groups	Characteristic syndrome.	

Staph Enterotoxin B (SEB)	HA, myalgias, N, V, NP cough, fever (depending on inhaled or oral ingestion)	1-6 h after exposure; groups	No bronchospasm/bronchorrhea; pupils normal	Incapacitating, not usually fatal
Ricin	Acute SOB/cough, fever, respiratory failure (inhaled); GI ingestion: severe N/V/pain/diarrhea; vascular collapse/death	4-8 hours post exposure. Groups if weaponized	No neuro/ anticholinergic symptoms	
Heat illness				
Exhaustion	Dizziness/weakness, thirst, fainting; temperature </=~103° F	Post exertion; hot or normal days; MOPP suit risk. Antihistamines; deconditioning; prior febrile illness. Groups.	Appropriate mental status; no anticholinergic symptoms	
Heat stroke	Temperature > 104°F, usually higher; CNS dysfunction. Prostration, vascular collapse	As above. Not this severe in groups.	No ocular, airway anticholinergic symptoms; may have N/V; less sweating	
Mass Hysteria	Headache, N, weakness, dizziness, faintness, occasional abdominal pain (NO V or D); no anticholinergic neuro effects	Adolescent or pre-teenage girls>> adult women, under stress; "spreads" with visual contact (close proximity)	Rapid resolution, occ relapse (when reassemble), no organic cause found	

* Diagnose with currently available kits